



OFFICE OF THE COUNTY EXECUTIVE  
ROCKVILLE, MARYLAND 20850

Isiah Leggett  
*County Executive*

January 17, 2017

The Honorable Tom Wheeler, Chairman  
The Honorable Mignon Clyburn, Commissioner  
The Honorable Ajit Pai, Commissioner  
The Honorable Michael O'Rielly, Commissioner  
Federal Communications Commission  
445 12th Street S.W.  
Washington, DC 20554  
Filed Electronically

RE: 2013 NOI – Reassessment of Federal Communications Commission Radiofrequency  
Exposure Limits and Policies (ET Docket No. 13-84, ET Docket No. 03-137)

Dear Chairman Wheeler and Commissioners:

I am writing to ask that you expedite completion of your 2013 Notice of Inquiry (NOI) to Reassess the Commission's Radiofrequency (RF) Exposure Limits and Policies (ET Dockets 13-84, 03-137). The best way the federal government can help speed the deployment of 5G technology would be to complete the 2013 NOI with all deliberate speed.

Montgomery County, Maryland is adjacent to our nation's capital, and we pride ourselves on being one of the most tech-savvy, tech-friendly counties, where our residents and businesses can have unparalleled access to the most advanced wireline and wireless broadband, and where our government, educational and research institutions are actively seeking to support innovation in Internet of Things devices, sensors, and applications. Indeed, there are 15 wireline and four major wireless broadband service providers occupying and operating within our public rights-of-way, and over 1,600 antennas deployed in over 800 locations throughout the County.

Recently, our County has received in four months, more applications for Distributed Antenna System (DAS) antennas and new mobile backhaul towers and poles, than we received

in the past eighteen years combined.<sup>1</sup> The requirements of 5G are likely to increase demands to place facilities in residential areas, where there has previously been very little deployment.<sup>2</sup>

A recent bill introduced by the Montgomery County Council to speed deployment of facilities shorter than 30 feet in residential areas was met by significant residential opposition.<sup>3</sup> The majority of residents expressed concerns about the health effects of RF emissions. In particular, residents are concerned about having so many antennas situated so close to home bedrooms.<sup>4</sup>

As you are aware, the County does not regulate wireless service facilities on the basis of the environmental effects of RF emissions, except to the extent that we may ensure compliance with the Commission's rules. However, the Commission adopted its present RF exposure limits in 1996. Lack of action by the Commission to either determine that the current rules are still adequate, or to take action to update the RF rules, is undermining public confidence that antennas can be safely operated in residential neighborhoods.<sup>5</sup>

This public doubt is echoed by the GAO. In July 2012, the GAO stated: "By not formally reassessing its current limit, FCC cannot ensure it is using a limit that reflects the latest research on RF energy exposure."<sup>6</sup> In response, the Commission opened the 2013 NOI to examine whether the current exposure limits remain appropriate in light of new research.

Yet, in the past three years, the Commission has not completed work on this NOI, which prompted U.S. Senator Richard Blumenthal and U.S. Representative Anna Eshoo in February

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<sup>1</sup> See Attachment A, New/Replacement Pole & Tower Applications (FY97-FY17), New/Replacement Pole & Tower Applications (FY13-FY17), Map of Recent Wireless Facility Applications, Applications by Type of Structure, Applications by Height of Structure (June-Nov 2016). Montgomery County's regulatory and zoning review processes are in compliance with all applicable FCC "shot clock" requirements, and we can process colocation applications within 30 days. However, in newer subdivisions where utilities are required to be installed underground, there may be very little existing infrastructure upon which to collocate antennas.

<sup>2</sup> We expect to receive another 500 applications in the next few years, which is consistent with the Chairman's statement that "there may be millions of small cell sites in the 5G future." Chairman Wheeler speech, CTIA Super Mobility Show 2016 (September 7, 2016).

<sup>3</sup> A video recording of the October 26, 2016, meeting is available at <http://www.montgomerycountymd.gov/cable/Towers/small-cell-towers.html>. Over 250 residents appeared in person to express their concerns about expanding deployment of antennas in residential areas. 50 percent of meeting participants asked questions or expressed concerns about the health effects of RF emissions.

<sup>4</sup> *In re Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies and Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, First Report and Order, Further Notice of Proposed Rulemaking, and Notice of Inquiry, ET Docket No. 13-84, ET Docket No. 03-137 (March 29, 2013) ("2013 NOI") at ¶ 5. In this proceeding, the Cities of Boston and Philadelphia noted: "Unlike early cell tower deployment, today's new repeater network technologies are deployed in closer proximity to users. As such, potential exposure comes not from the receiving device – the phone – but rather the transmission device." 2013 NOI Reply Comments of the Cities of Boston and Philadelphia (Nov. 18, 2013) at p. 3.

<sup>5</sup> See Attachment B for a partial list of citations to post-1996 RF studies submitted by Montgomery County residents to their elected officials.

<sup>6</sup> United State Government Accountability Office, Report to Congressional Requestors, *TELECOMMUNICATIONS: Exposure and Testing for Mobile Phones Should Be Reassessed*, GAO-12-1771 (July 2012). The GAO recommended: "FCC formally reassess and, if appropriate, change its current RF energy exposure limit and mobile phone testing requirements related to likely usage configurations, particularly when phones are held against the body." See summary excerpt, Attachment C.

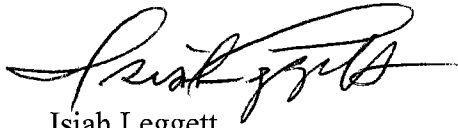
2015, to ask the Commission to complete the 2013 RF proceeding. Chairman Wheeler responded that he directed his staff "to prioritize this proceeding."<sup>7</sup> And yet, almost two years later, the 2013 NOI has not been completed and the 1996 RF rules remain in place.

While the Commission may believe that the 1996 RF rules are still appropriate, we support the work of the Commission and other federal agencies to either confirm that the current rule and procedures are still appropriate, or to update them. We also appreciate Chairman Wheeler's statement that the Commission needs "to help leaders at the local level" help the public understand the benefits of 5G.

The best way for you to help us is to complete your work on the 2013 NOI within the next 150 days. This will allow us to assure the public that the current federal RF rules reflect the most recent scientific research and address deployment of 5G antenna sites closer to residents. At the local level, we will continue to work to help residents understand how access to 5G services will benefit everyone and can help improve home values, and to find reasonable solutions to address deployment of antennas in residential neighborhoods.

Thank you for your work and attention to this matter, and to our mutual partnership to continue to support better broadband for all Americans.

Sincerely,



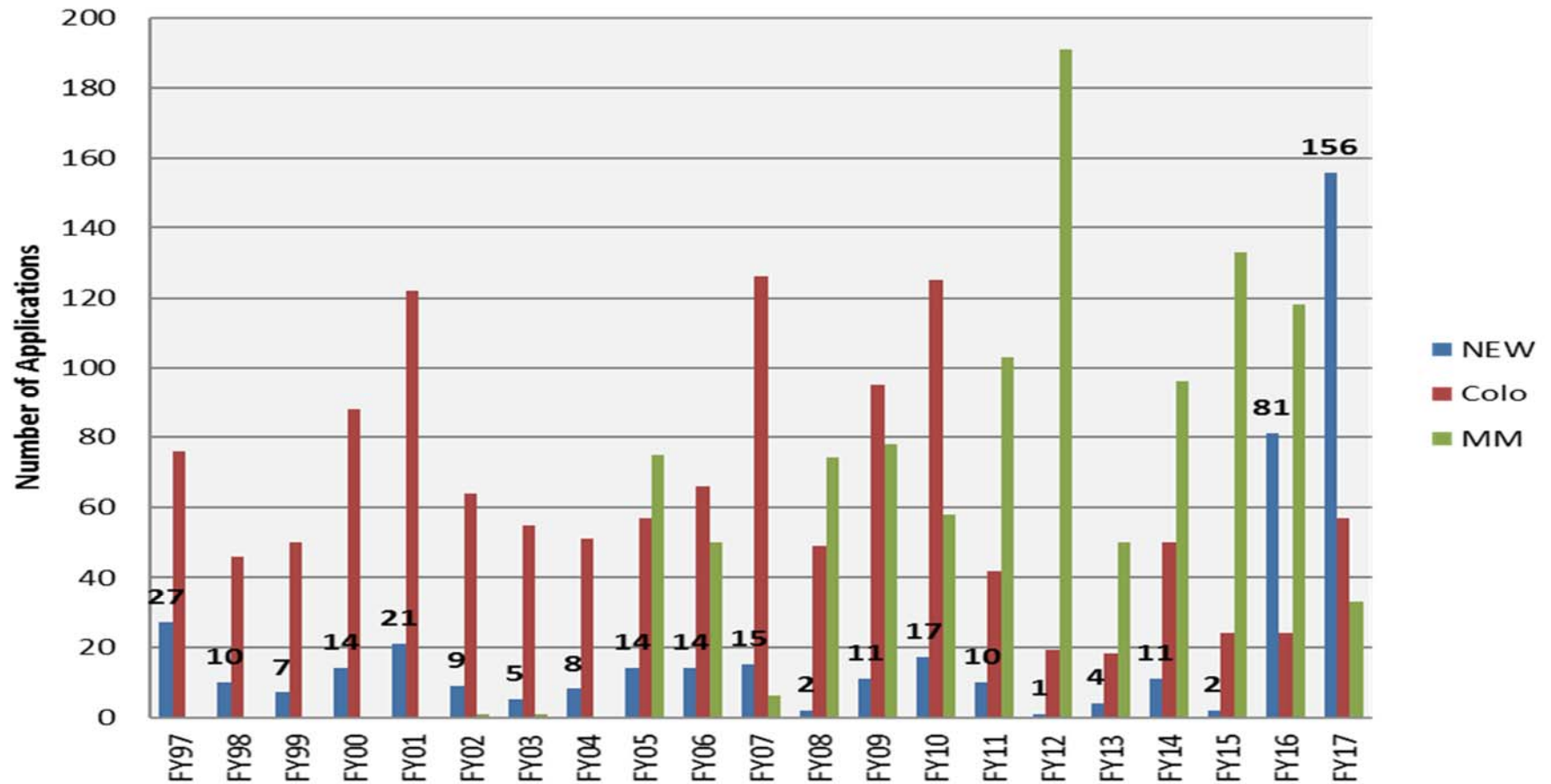
Isiah Leggett  
County Executive

cc: Senator Ben Cardin  
Senator Chris Van Hollen  
Congressman John Sarbanes  
Congressman John Delaney  
Congressman Jamie Raskin  
Senator John Thune  
Senator Bill Nelson  
Senator Roger Wicker  
Senator Brian Schatz  
Senator Jerry Moran  
Senator Richard Blumenthal  
Congressman Greg Walden  
Congressman Frank Pallone  
Congresswoman Marsha Blackburn  
Congressman Michael Doyle  
Montgomery County Councilmembers

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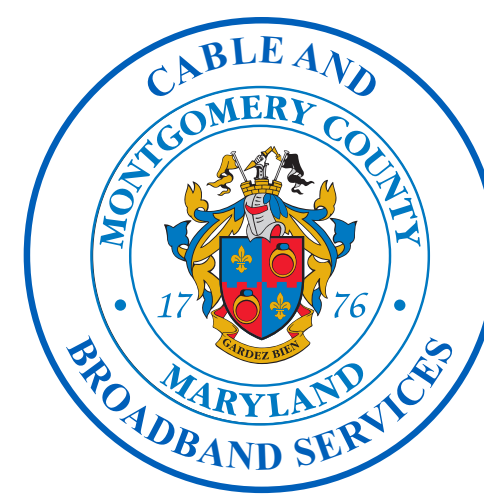
<sup>7</sup> See Attachment D.

**Montgomery County, Maryland Transmission Facilities Coordinating Group  
New/Replacement Poles & Towers, Co-Located Antennas, and Antenna Modifications FY97-FY17 (partial)**



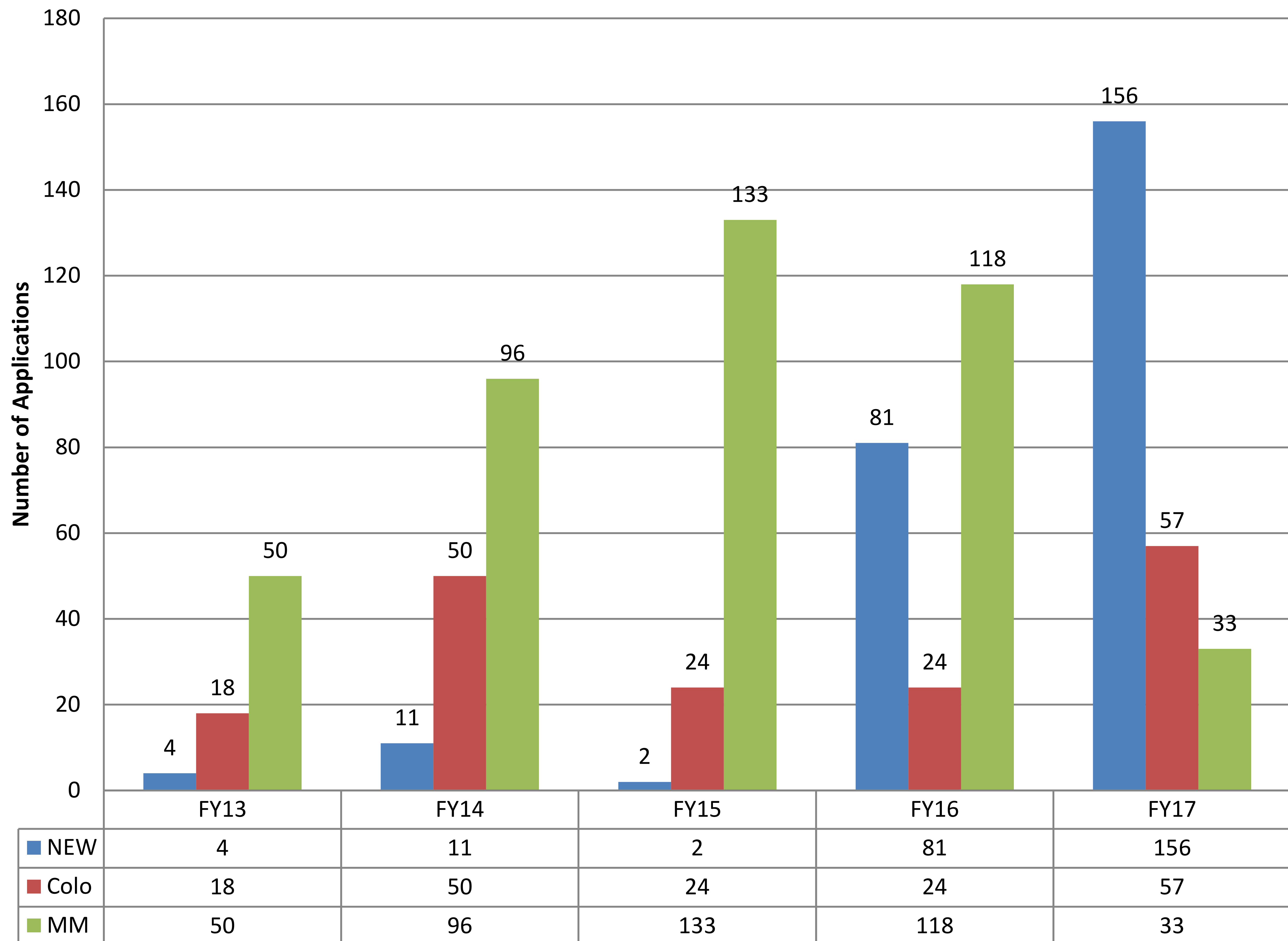
**More application for New/Replacement Poles were received between June and October 2016, than in the previous 18 years combined (County Fiscal Year runs July 1 to June 30)**





# Transmission Facilities Coordinating Group

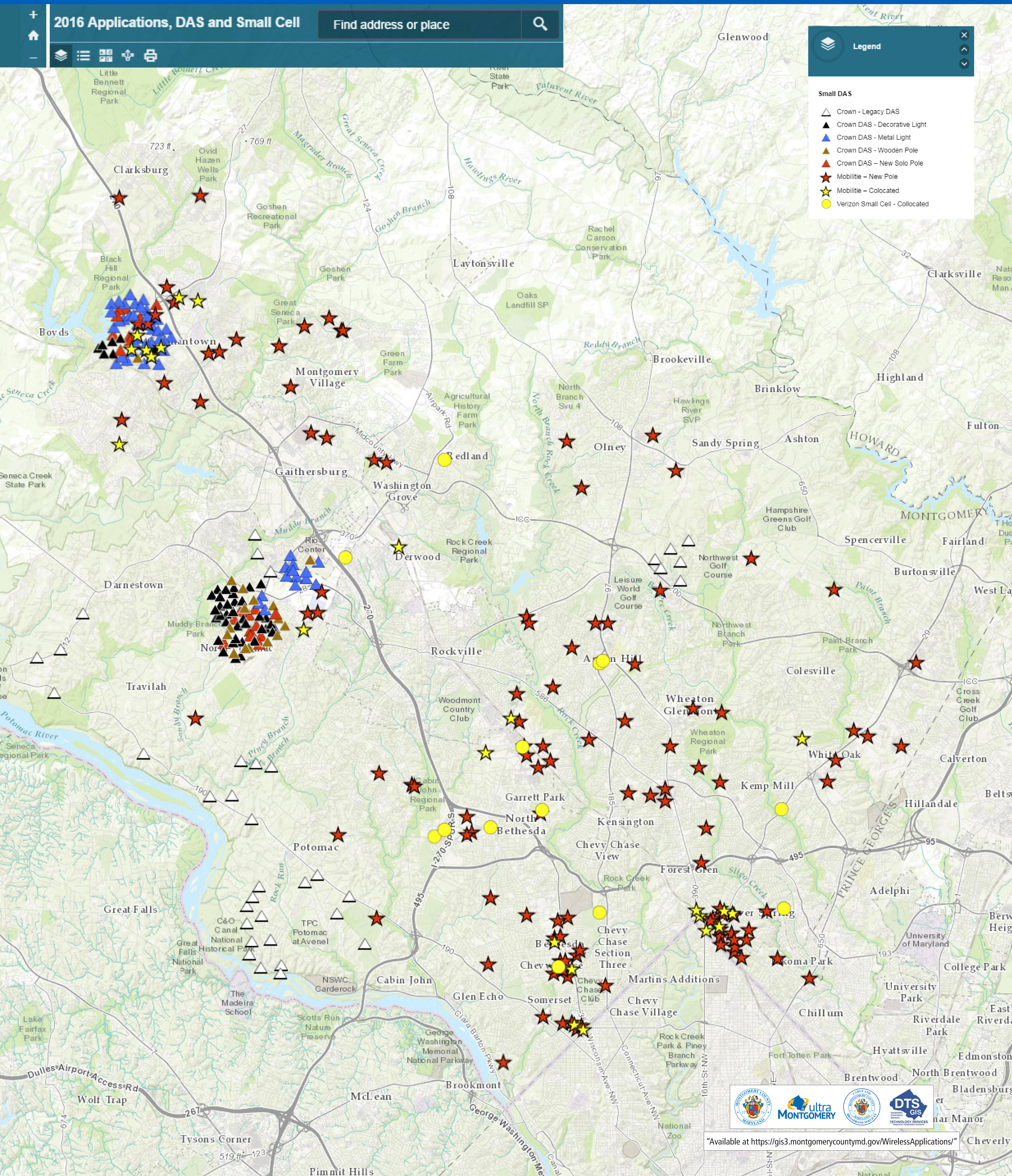
## NEW/REPLACEMENT POLES AND TOWERS CO-LOCATED ANTENNAS & ANTENNA MODIFICATIONS





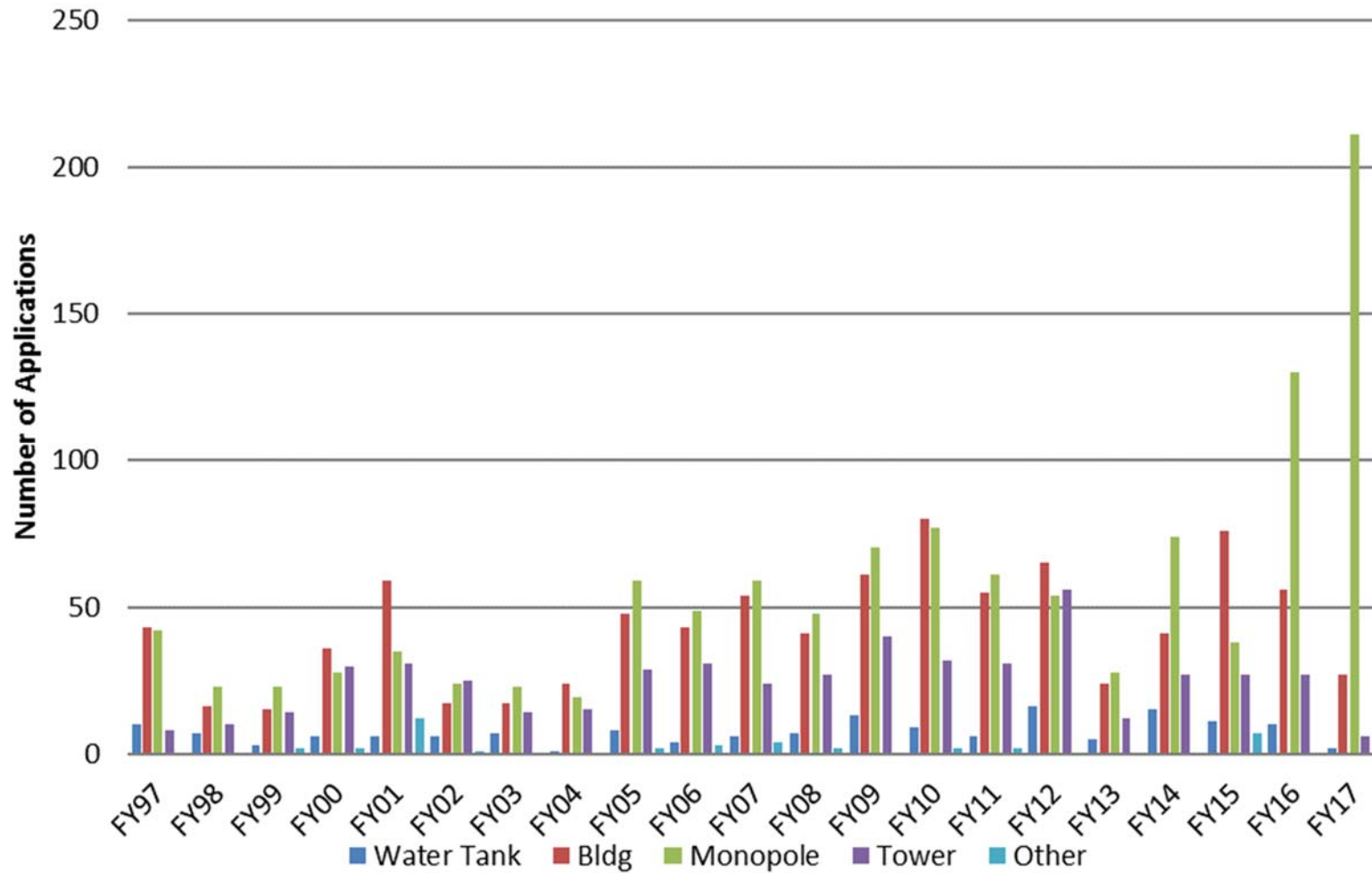
# Transmission Facilities Coordinating Group

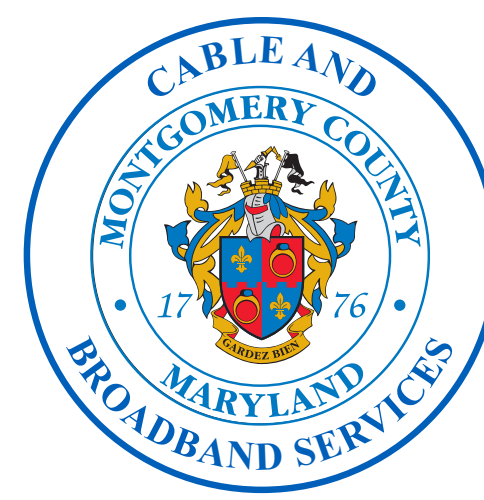
## Recent Wireless Facility Applications



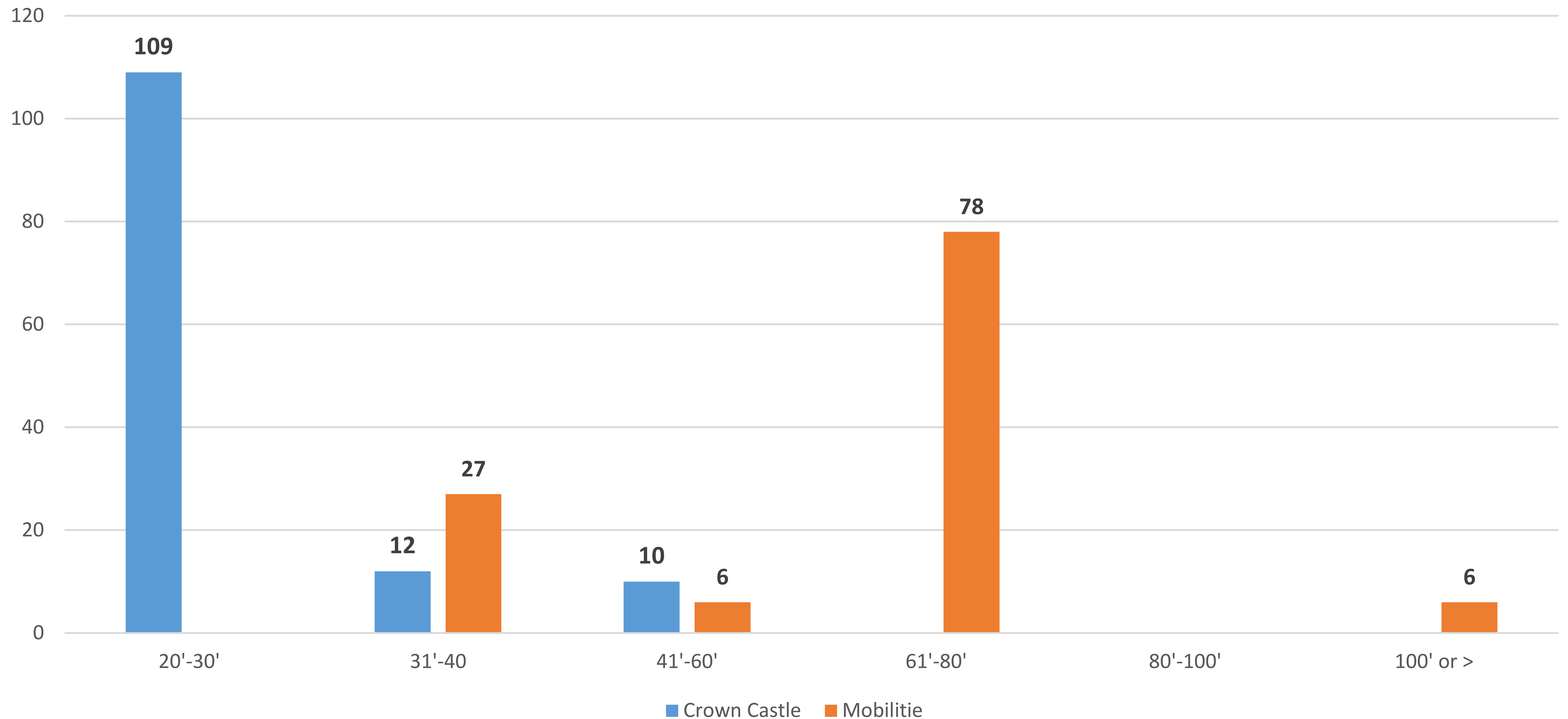


**Transmission Facilities Coordinating Group  
Applications Received by Type of Structure**





# Transmission Facilities Coordinating Group JUNE TO NOVEMBER 2016 APPLICATIONS RECEIVED BY HEIGHT OF STRUCTURE





**Post-1996 RF Research Studies**  
**Submitted by Montgomery County Residents to Elected Officials**

**Research on RF Radiation Effects on Humans**

Gulati S, Yadav A, Kumar N, Kanupriya, Aggarwal NK, Kumar R, Gupta R. [Effect of GSTM1 and GSTT1 Polymorphisms on Genetic Damage in Humans Populations Exposed to Radiation From Mobile Towers](#) Arch Environ Contam Toxicol. 2015 Aug 5. [Epub ahead of print] (2016)

- In our study, 116 persons exposed to radiation from mobile towers and 106 control subjects were genotyped for polymorphisms in the GSTM1 and GSTT1 genes by multiplex polymerase chain reaction method. DNA damage in peripheral blood lymphocytes was determined using alkaline comet assay in terms of tail moment (TM) value and micronucleus assay in buccal cells (BMN). Our results indicated that TM value and BMN frequency were higher in an exposed population compared with a control group and the difference is significant. In our study, we found that different health symptoms, such as depression, memory status, insomnia, and hair loss, were significantly associated with exposure to EMR. Damaging effects of nonionizing radiation result from the generation of reactive oxygen species (ROS) and subsequent radical formation and from direct damage to cellular macromolecules including DNA.

[A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station.](#) Ghandi et al, 2014 (India):

- This cross-sectional case control study on genetic damage in individuals living near cell towers found genetic damage parameters of DNA were significantly elevated. The authors state, "The genetic damage evident in the participants of this study needs to be addressed against future disease-risk, which in addition to neurodegenerative disorders, may lead to cancer."

Shinjyo, T. & Shinjyo, A. (2014), [Signifikanter Rückgang klinischer Symptome nach Senderabbau – eine Interventionsstudie. \(English-Significant Decrease of Clinical Symptoms after Mobile Phone Base Station Removal – An Intervention Study\)](#) Tetsuharu Shinjyo and Akemi Shinjyo  
Umwelt-Medizin-Gesellschaft, 27(4), S. 294-301.

- This research was undertaken to investigate the validity of concerns about whether chronic exposure to radiofrequency electromagnetic fields (RF-EMFs) emitted from mobile phone base station antennas could cause adverse health effects. Methods: We investigated possible adverse effects on the health of condominium inhabitants who were exposed from 1998 to 2009 to the radiation from mobile phone base station antennas installed on top of their condominium. To accomplish this, in January and November 2009, 107 of 122 inhabitants were interviewed and underwent medical examinations. The first examination was carried out while the base station was in operation, the second examination three months after the base station antennas were removed once and for all. Results: In several cases, significant effects on the inhabitants' health could be proven. The health of these inhabitants was shown to improve after the removal of the antennas, and the researchers could identify no other factors that could explain this health improvement. Conclusions and recommendations: The results of these examinations and interviews indicate a connection between adverse health effects and electromagnetic radiation from mobile phone base stations. Further research and studies are recommended regarding the possible adverse health effects of RF-EMFs. These results lead us to question the construction of mobile phone base stations on top of buildings such as condominiums or houses.

Carpenter, D. O. [Human disease resulting from exposure to electromagnetic fields](#), Reviews on Environmental Health, Volume 28, Issue 4, Pages 159172 (2013).

- This review summarizes the evidence stating that excessive exposure to magnetic fields from power lines and other sources of electric current increases the risk of development of some cancers and neurodegenerative diseases, and that excessive exposure to RF radiation increases risk of cancer, male infertility, and neurobehavioral abnormalities.

**Post-1996 RF Research Studies**  
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**SAFETY ZONE DETERMINATION FOR WIRELESS CELLULAR TOWER** Nyakyi et al, Tanzania (2013)

- This research looked at the radiation that cell towers emit and states a safety zone is needed around the towers to ensure safe sleeping areas. The authors state that "respective authorities should ensure that people reside far from the tower by 120m or more depending on the power transmitted to avoid severe health effect."

**Long-term exposure to microwave radiation provokes cancer growth: evidences from radars and mobile communication systems.** Yakymenko, 2011

- We conclude that recent data strongly point to the need for re-elaboration of the current safety limits for non-ionizing radiation using recently obtained knowledge. We also emphasize that the everyday exposure of both occupational and general public to MW radiation should be regulated based on a precautionary principles which imply maximum restriction of excessive exposure.

Eskander EF et al, (November 2011) **How does long term exposure to base stations and mobile phones affect human hormone profiles?** Clin Biochem. 2011 Nov 27.

- Showed significant decrease in volunteers' ACTH, cortisol, thyroid hormones, prolactin for young females, and testosterone levels from RF exposures from both mobiles and cell towers.

**Mortality by neoplasia and cellular telephone base stations.** Dode et al., 2011 (Brazil):

- A clearly elevated relative risk of cancer mortality at residential distances of 500 meters or less from cell phone transmission towers. This 10 year study on cell phone antennas was released by the Municipal Health Department in Belo Horizonte and several universities in Brazil. Shortly after this study was published, the city prosecutor sued several cell phone companies and requested that almost half of the cities antennae be removed. Many were.

**Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations** Khurana, Hardell et al., Int. J Occup. Envir Health, Vol 16(3):263267, 2010

- 10 epidemiological studies that assessed for putative health effects of mobile phone base stations. Seven of these studies explored the association between base station proximity and neurobehavioral effects and three investigated cancer. We found that eight of the 10 studies reported increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances < 500 meters from base stations.
- None of the studies reported exposure above accepted international guidelines, suggesting that current guidelines may be inadequate in protecting the health of human populations. We believe that comprehensive epidemiological studies of long-term mobile phone base station exposure are urgently required to more definitively understand its health impact.

Levitt & Lai, **Biological Effects from Exposure to Electromagnetic Radiation Emitted by Cell Tower Base Stations and Other Antenna Arrays,** Environmental Reviews, 2010

- Over 100 citations, approximately 80% of which showed biological effects near towers. "Both anecdotal reports and some epidemiology studies have found headaches, skin rashes, sleep disturbances, depression, decreased libido, increased rates of suicide, concentration problems, dizziness, memory changes, increased risk of cancer, tremors, and other neurophysiological effects in populations near base stations. Built case for 'setbacks' and need for new exposure guidelines reflecting multiple and cumulative exposures

**Oberfeld et al, 2008 (Austria)**

- All subjects reported various symptoms during exposure including buzzing in the head, heart palpitations, unwellness, lightheadedness, anxiety, breathlessness, respiratory problems, nervousness, agitation, headache, tinnitus, heat sensation, and depression.

**Neurobehavioral effects among inhabitants around mobile phone base stations,** Neurotoxicology, G. Abdel-Rassoul, et al., (2007)

- "Conclusions and recommendations: Inhabitants living nearby mobile phone base stations are at risk for developing neuropsychiatric problems and some changes in the performance of

**Post-1996 RF Research Studies**  
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neurobehavioral functions either by facilitation or inhibition. So, revision of standard guidelines for public exposure to RER from mobile phone base station antennas and using of NBTB for regular assessment and early detection of biological

**Abdel-Rassoul et al, 2007 (Egypt)**

- Residents living beneath and opposite a long established mobile phone mast reported significantly higher occurrences of headaches, memory changes, dizziness, tremors, depressive symptoms and sleep disturbance than a control group.

**Hutter et al, 2006 (Austria)**

- A significant correlation between measured power density and headaches, fatigue, and difficulty in concentration in 365 subjects.

Hutter HP et al, (May 2006) **Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations**, Occup Environ Med. 2006 May;63(5):307-13

- Found a significant relationship between some cognitive symptoms and measured power density; highest for headaches. Perceptual speed increased, while accuracy decreased insignificantly with increasing exposure levels. There was no significant effect on sleep quality.

**Bortkiewicz et al, 2004 (Poland)**

- Residents close to mobile phone masts reported: more incidences of circulatory problems, sleep disturbances, irritability, depression, blurred vision and concentration difficulties the nearer they lived to the mast.
- The performed studies showed the relationship between the incidence of individual symptoms, the level of exposure, and the distance between a residential area and a base station.

**Wolf et al, 2004 (Israel)**

- A four-fold increase in the incidence of cancer among residents living within 300m radius of a mobile phone mast for between three and seven years was detected.

**Eger et al, 2004 (Germany)**

- A three-fold increase in the incidence of malignant tumours was found after five years' exposure in people living within 400m radius of a mobile phone mast.

**The Microwave Syndrome: A preliminary Study**. Navarro E, 2003 (Spain)

- Statistically significant positive exposure-response associations between field intensity and fatigue, irritability, headaches, nausea, loss of appetite, sleeping disorder, depressive tendency, feeling of discomfort, difficulty in concentration, loss of memory, visual disorder, dizziness and cardiovascular problems. Two different exposure groups also showed an increase of the declared severity in the group with the higher exposure.

**Investigation on the health of people living near mobile telephone relay stations: Incidence according to distance and sex** Santini et al, 2002 (France)

- 530 people living near mobile phone masts reported more symptoms of headache, sleep disturbance, discomfort, irritability, depression, memory loss and concentration problems the closer they lived to the mast. This first study on symptoms experienced by people living in vicinity of base stations shows that, in view of radioprotection, minimal distance of people from cellular phone base stations should not be < 300 m.

**Additional Research on RF Radiation**

L. Lloyd Morgan, Santosh Kesari, Devra Lee Davis. **Why children absorb more microwave radiation than adults: The consequences**. Journal of Microscopy and Ultrastructure. DOI: 10.1016/j.jmau.2014.06.005. In press. Published online Jul 15, 2014.

- International Cancer registries are showing a rise in brain cancer. Children absorb more microwave radiation, a Class 2 B possible carcinogen than adults. The fetus is in greater danger than children from exposure to MWR. The legal exposure limits have remained unchanged for



**Post-1996 RF Research Studies**  
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decades. Cellphone manuals warnings and the 20 cm rule for tablets/laptops violate the “normal operating position” regulation.

Coureau G, Bouvier G, Lebailly P, Fabbro-Peray P, Gruber A, Leffondre K, Guillamo JS, Loiseau H, Mathoulin-Pélissier S, Salamon R, Baldi I. (2014). [Mobile phone use and brain tumours in the CERENAT case-control study](#). Occup Environ Med. 71(7), 514-22.

- "However, the positive association was statistically significant in the heaviest users when considering life-long cumulative duration for meningiomas and number of calls for gliomas. Risks were higher for gliomas, temporal tumours, occupational and urban mobile phone use. These additional data support previous findings concerning a possible association between heavy mobile phone use and brain tumours."

Davis DL, Kesari S, Soskolne CL, Miller AB, Stein Y. (2013). [Swedish review strengthens grounds for concluding that radiation from cellular and cordless phones is a probable human carcinogen](#). Pathophysiology. 20(2), 123-9.

- "If the increased brain cancer risk found in young users in these recent studies does apply at the global level, the gap between supply and demand for oncology services will continue to widen. Many nations, phone manufacturers, and expert groups, advise prevention in light of these concerns by taking the simple precaution of "distance" to minimize exposures to the brain and body. We note that brain cancer is the proverbial "tip of the iceberg"; the rest of the body is also showing effects other than cancers."

Hardell L, Carlberg M, Söderqvist F, Mild K. (2013). [Case-control study of the association between malignant brain tumours diagnosed between 2007 and 2009 and mobile and cordless phone use](#). International Journal of Oncology 43(6), 1833-45.

- "This study confirmed previous results of an association between mobile and cordless phone use and malignant brain tumours. These findings provide support for the hypothesis that RF-EMFs play a role both in the initiation and promotion stages of carcinogenesis".

**The Bioinitiative 2012 Report;**

- A Comprehensive Overview of the Science by experts in the field. It is broken down into Chapters on various health effects. Notably, it also has the abstracts of the research (All research since 2007 with a SEARCH feature). It also has color charts so that you can see the levels of radiation and compare this to the effects shown in research studies.

Aldad et al., [Fetal Radiofrequency Radiation Exposure From 800-1900 Mhz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice](#). Scientific Reports, 2012; 2 DOI:

- Mice that were exposed to radiation tended to be more hyperactive and had reduced memory capacity. Authors attributed the behavioral changes to an effect during pregnancy on the development of neurons in the prefrontal cortex region of the brain.

Hardell L, Carlberg M, Hansson, Mild K. (2006). [Pooled analysis of two case-control studies on the use of cellular and cordless telephones and the risk of benign brain tumours diagnosed during 1997-2003](#). International Journal of Oncology. 509-18.

- In the multivariate analysis, a significantly increased risk of acoustic neuroma was found with the use of analogue phones.

Martin L. Pall. [Microwave electromagnetic fields act by activating voltage-gated calcium channels: why the current international safety standards do not predict biological hazard](#). Recent Res. Devel. Mol. Cell Biol. 7(2014).

- "It can be seen from the above that 10 different well-documented microwave EMF effects can be easily explained as being a consequence of EMF VGCC activation: oxidative stress, elevated single and double strand breaks in DNA, therapeutic responses to such EMFs, breakdown of the blood-brain barrier, cancer, melatonin loss, sleep dysfunction, male infertility and female infertility."

**Post-1996 RF Research Studies**  
**Submitted by Montgomery County Residents to Elected Officials**

**Additional Research**

- Kesari et al., [Effect of 3G cell phone exposure with computer controlled 2-D stepper motor on non-thermal activation of the hsp27/p38MAPK stress pathway in rat brain](#). Cell Biochem Biophys. 2014 Mar;68(2):347-58. <http://www.ncbi.nlm.nih.gov/pubmed/23949848>
- Aldad T, Gan G, Gao X, Taylor H.(2012). [Fetal Radiofrequency Radiation Exposure From 800-1900 Mhz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice](#). Scientific Reports. 2, 3-12. <http://www.nature.com/srep/2012/120315/srep00312/full/srep00312.html>
- Razavinasab M1, Moazzami K, Shabani M. [Maternal mobile phone exposure alters intrinsic electrophysiological properties of CA1 pyramidal neurons in rat offspring](#). Toxicol Ind Health. 2014 Mar 6. <http://www.ncbi.nlm.nih.gov/pubmed/24604340>
- Gandhi OP, Morgan LL, De Salles AA, Han YY, Herberman RB, Davis DL. (2012). [Exposure limits: the underestimation of absorbed cell phone radiation, especially in children](#). Electromagn Biol Med. 31(1), 3451. <http://www.ncbi.nlm.nih.gov/pubmed/21999884>
- Chen C, [Exposure to 1800 MHz radiofrequency radiation impairs neurite outgrowth of embryonic neural stem cells](#). Sci Rep. May 29, 2014 <http://www.ncbi.nlm.nih.gov/pubmed/24869783?dopt=Abstract>
- A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Fields (ELF and RF)  
<http://www.bioinitiative.org/>
- Dr. Erica Mallery--Blythe [Physicians' Health Initiative for Radiation and Environment - UK](#) "Electromagnetic Radiation and Children" November 2014  
Lecture <https://www.youtube.com/watch?v=sNFdZVeXw7M>
- Dr. Devra Davis scientific presentation on RF radiation at the National Institute of Environmental Health Sciences (NIEHS) <https://www.youtube.com/watch?v=wNNSztN7wJc>
- Blackman, C., 2009. Cell phone radiation: Evidence from ELF and RF studies supporting more inclusive risk identification and assessment. Pathophysiology 16, 205-216. <http://www.pathophysiologyjournal.com/article/S0928-4680%2809%2900004-2/abstract>
- Levitt & Lai, Biological Effects from Exposure to Electromagnetic Radiation Emitted by Cell Tower Base Stations and Other Antenna Arrays, Environmental Reviews, 2010 <http://www.researchgate.net/publication/233593841>
- Long-term exposure to microwave radiation provokes cancer growth: evidences from radars and mobile communication systems. Yakymenko , 2011 <http://www.ncbi.nlm.nih.gov/pubmed/21716201>
- Carpenter, D. O. Human disease resulting from exposure to electromagnetic fields, Reviews on Environmental Health, Volume 28, Issue 4, Pages 159172. <http://www.ncbi.nlm.nih.gov/pubmed/24280284>
- Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations Khurana, Hardell et al., Int. J Occup. Envir Health, Vol 16(3):263267, 2010 <http://www.researchgate.net/publication/45387389>
- Mortality by neoplasia and cellular telephone base stations. Dode et al., 2011 (Brazil): <http://www.sciencedirect.com/science/article/pii/S0048969711005754>
- Ronni Wolf and Danny Wolf, INCREASED INCIDENCE OF CANCER NEAR A CELLPHONE TRANSMITTER STATION. International Journal of Cancer Prevention VOLUME 1, NUMBER 2, APRIL 2004 [http://www.emf-health.com/PDFreports/Israelstudy\\_celltower.pdf](http://www.emf-health.com/PDFreports/Israelstudy_celltower.pdf)

**Post-1996 RF Research Studies**  
**Submitted by Montgomery County Residents to Elected Officials**

Horst Eger, Klaus Uwe Hagen, Birgitt Lucas, Peter Vogel, Helmut Voit, The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer, Umwelt·Medizin·Gesellschaft 17,4 2004, [http://www.powerwatch.org.uk/news/20041118\\_naila.pdf](http://www.powerwatch.org.uk/news/20041118_naila.pdf)

Mortality by neoplasia and cellular telephone base stations. Dode et al., 2011 (Brazil): <http://www.sciencedirect.com/science/article/pii/S0048969711005754>

Neurobehavioral effects among inhabitants around mobile phone base stations, Neurotoxicology, G. Abdel-Rassoul, et al., (2007) <http://www.ncbi.nlm.nih.gov/pubmed/16962663>

A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station. Ghandi et al, 2014 (India) <http://www.ncbi.nlm.nih.gov/pubmed/25006864>

SAFETY ZONE DETERMINATION FOR WIRELESS CELLULAR TOWER Nyakyi et al, Tanzania (2013) [http://ijret.org/Volumes/V02/I09/IJRET\\_110209029.pdf](http://ijret.org/Volumes/V02/I09/IJRET_110209029.pdf)

Hutter HP et al, (May 2006) Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations, Occup Environ Med. 2006 May;63(5):307-13 <http://www.ncbi.nlm.nih.gov/pubmed/1662185>

Eskander EF et al, (November 2011) How does long term exposure to base stations and mobile phones affect human hormone profiles? Clin Biochem. 2011 Nov 27. <http://www.ncbi.nlm.nih.gov/pubmed/22138021>

Investigation on the health of people living near mobile telephone relay stations: Incidence according to distance and sex Santini et al, 2002 (France) <http://www.ncbi.nlm.nih.gov/pubmed/12168254>

The Microwave Syndrome: A preliminary Study. Navarro E, 2003 (Spain) Pathol Biol (Paris). 2002 Jul;50(6):369-73. <http://www.emf-portal.de/viewer.php?aid=13498&l=e>

Bortkiewicz A1, Zmysłony M, Szykowska A, Gadzicka E. Subjective symptoms reported by people living in the vicinity of cellular phone base stations: review, Med Pr. 2004;55(4):345-51. <http://www.ncbi.nlm.nih.gov/pubmed/15620045>



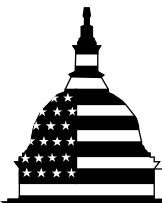


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July 2012

# TELECOMMUNICATIONS

## Exposure and Testing Requirements for Mobile Phones Should Be Reassessed



G A O

Accountability \* Integrity \* Reliability



Highlights of [GAO-12-771](#), a report to congressional requesters

## Why GAO Did This Study

The rapid adoption of mobile phones has occurred amidst controversy over whether the technology poses a risk to human health as a result of long-term exposure to RF energy from mobile phone use. FCC and FDA share regulatory responsibilities for mobile phones. GAO was asked to examine several issues related to mobile phone health effects and regulation.

Specifically, this report addresses (1) what is known about the health effects of RF energy from mobile phones and what are current research activities, (2) how FCC set the RF energy exposure limit for mobile phones, and (3) federal agency and industry actions to inform the public about health issues related to mobile phones, among other things. GAO reviewed scientific research; interviewed experts in fields such as public health and engineering, officials from federal agencies, and representatives of academic institutions, consumer groups, and the mobile phone industry; reviewed mobile phone testing and certification regulations and guidance; and reviewed relevant federal agency websites and mobile phone user manuals.

## What GAO Recommends

FCC should formally reassess and, if appropriate, change its current RF energy exposure limit and mobile phone testing requirements related to likely usage configurations, particularly when phones are held against the body. FCC noted that a draft document currently under consideration by FCC has the potential to address GAO's recommendations.

View [GAO-12-771](#). For more information, contact Mark Goldstein at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov), or Marcia Crosse at (202) 512-7114 or [crossem@gao.gov](mailto:crossem@gao.gov).

July 2012

## TELECOMMUNICATIONS

### Exposure and Testing Requirements for Mobile Phones Should Be Reassessed

## What GAO Found

Scientific research to date has not demonstrated adverse human health effects of exposure to radio-frequency (RF) energy from mobile phone use, but research is ongoing that may increase understanding of any possible effects. In addition, officials from the Food and Drug Administration (FDA) and the National Institutes of Health (NIH) as well as experts GAO interviewed have reached similar conclusions about the scientific research. Ongoing research examining the health effects of RF energy exposure is funded and supported by federal agencies, international organizations, and the mobile phone industry. NIH is the only federal agency GAO interviewed directly funding studies in this area, but other agencies support research under way by collaborating with NIH or other organizations to conduct studies and identify areas for additional research.

The Federal Communications Commission's (FCC) RF energy exposure limit may not reflect the latest research, and testing requirements may not identify maximum exposure in all possible usage conditions. FCC set an RF energy exposure limit for mobile phones in 1996, based on recommendations from federal health and safety agencies and international organizations. These international organizations have updated their exposure limit recommendation in recent years, based on new research, and this new limit has been widely adopted by other countries, including countries in the European Union. This new recommended limit could allow for more RF energy exposure, but actual exposure depends on a number of factors including how the phone is held during use. FCC has not adopted the new recommended limit. The Office of Management and Budget's instructions to federal agencies require the adoption of consensus standards when possible. FCC told GAO that it relies on the guidance of federal health and safety agencies when determining the RF energy exposure limit, and to date, none of these agencies have advised FCC to change the limit. However, FCC has not formally asked these agencies for a reassessment. By not formally reassessing its current limit, FCC cannot ensure it is using a limit that reflects the latest research on RF energy exposure. FCC has also not reassessed its testing requirements to ensure that they identify the maximum RF energy exposure a user could experience. Some consumers may use mobile phones against the body, which FCC does not currently test, and could result in RF energy exposure higher than the FCC limit.

Federal agencies and the mobile phone industry provide information on the health effects of mobile phone use and related issues to the public through their websites and mobile phone manuals. The types of information provided via federal agencies' websites on mobile phone health effects and related issues vary, in part because of the agencies' different missions, although agencies provide a broadly consistent message. Members of the mobile phone industry voluntarily provide information on their websites and in mobile-phone user manuals. There are no federal requirements that manufacturers provide information to consumers about the health effects of mobile phone use.

OFFICE OF  
THE CHAIRMANFEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON

DEC 7 - 2015

Federal Communications Commission  
Office of the Secretary

November 24, 2015

ET Doc. 13-84

The Honorable Anna G. Eshoo  
U.S. House of Representatives  
241 Cannon House Office Building  
Washington, D.C. 20515

Dear Congresswoman Eshoo:

Thank you for inquiring about the Commission's work to ensure RF emission safety protocols for America's workers. I am pleased that the Commission's Office of Engineering and Technology (OET) Chief recently briefed your staff on this matter. I understand that they discussed some of the issues concerning our work with other agencies, general enforcement efforts, and the FCC's ongoing rulemaking related to RF radiation exposure. This is a very important issue for the Commission and we have been focused on ensuring the safety of those who work in proximity to RF emitters.

On March 29, 2013, the Commission adopted a *Report and Order, Further Notice of Proposed Rulemaking and Notice of Inquiry*, based in part on the developing understanding of RF radiation issues since our prior inquiries. Since then, we have received nearly a thousand comments totaling more than 20,000 pages.

The current proceeding is complex and involves several other agencies with expertise in health, human RF radiation exposure, and safety issues. As you are aware, the Commission is not the expert subject matter agency for health and safety and, accordingly, we rely on our partner agencies to provide guidance on such matters. On February 4, 2015, the OET Chief sent letters to respective counterparts at regulatory health and safety agencies, including the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and the Occupational Safety and Health Administration (OSHA), encouraging their contribution of comments to our record in response to the substantive issues we raised. These letters were in addition to the Commission's regular and ongoing staff-level communications with our partner agencies on RF issues.

Please be assured that I take the ongoing process very seriously and I have directed my staff to prioritize this proceeding. Last year, I was joined by Secretary of Labor, Thomas Perez, in conducting a workshop at the Commission to explore issues surrounding tower climber safety. In conjunction with OSHA, the Commission's workshop focused on injury prevention and fatalities involving work on communications towers. This working relationship with OSHA is ongoing and has led to successful, collaborative efforts to increase awareness and education and reduce on-the-job injuries for tower workers.

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Page 2—The Honorable Anna G. Eshoo

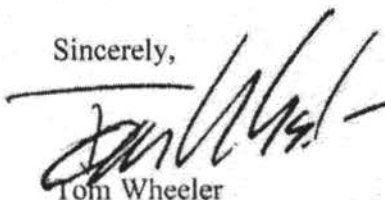
As you correctly identify in your letter, workers who are not routinely servicing the towers themselves, such as rooftop maintenance staff, electricians and painters, however, create a different set of job site concerns. Many of the safety issues in those cases are related to signage and devices to provide exposure warnings of towers that might otherwise be unseen or nearby. While the Commission is actively considering how its rules can better protect these other classes of workers, the Commission's Enforcement Bureau is instrumental in ensuring compliance with its existing safety rules.

As you note, in 2014 the Commission entered a consent decree with Verizon related to alleged violations of its safety rules, leading to a \$50,000 forfeiture and the carrier's agreement to implement a compliance plan to provide training and take other safety measures in order to protect its employees, contractors and others who may come into contact with RF emissions from its wireless facilities. I understand that Verizon Wireless has spent at least \$4.2 million to inspect all of its 5,000 rooftop antenna sites and to review and update RF exposure warning signage at access and antenna points. Also, employees at the company's two network operations centers have been trained on how to inform individuals working near transmitter sites on safety measures.

This is just one example of investigations that the Commission is conducting to enforce tower/RF safety rules. After the OET Chief briefed your staff, the Commission released two Notices of Apparent Liability proposing forfeitures of \$60,000 and \$25,000 against T-Mobile and WirelessCo, respectively, for failing to adequately prevent public access to areas near rooftop stations that exceeded general population radiofrequency emission limits. We are committed to continue the diligent enforcement of our rules so as to ensure worker safety.

Given your significant concerns about the current ongoing proceeding, I have directed our staff to add your letter to the docket to ensure that your views are considered as we move toward a formal resolution. Thank you again for your interest and the opportunity to brief your staff.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Wheeler", with a horizontal line extending from the end of the signature.

Tom Wheeler





FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON

OFFICE OF  
THE CHAIRMAN

November 24, 2015

The Honorable Richard Blumenthal  
United States Senate  
702 Hart Senate Office Building  
Washington, D.C. 20510

Dear Senator Blumenthal:

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Page 2—The Honorable Richard Blumenthal

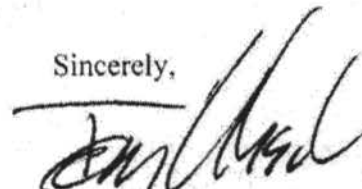
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Given your significant concerns about the current ongoing proceeding, I have directed our staff to add your letter to the docket to ensure that your views are considered as we move toward a formal resolution. Thank you again for your interest and the opportunity to brief your staff.

Sincerely,



Tom Wheeler



942 DET

Congress of the United States  
Washington, DC 20510

Spectrum  
RF  
Radiation

September 17, 2015

The Honorable Tom Wheeler, Chairman  
Federal Communications Commission  
445 12th St., Southwest  
Washington, D.C. 20554

Dear Chairman Wheeler,

We write with concern for the health and safety of the estimated 250,000 people who work each year in close proximity to cellular antennas and may be exposed to radiofrequency (RF) radiation in excess of the Federal Communications Commission's (FCC's) human exposure limits. Excessive exposure to RF radiation leads to well-documented potential harms, especially to workers who spend time near the antenna and in the line of the antenna's beam. At sufficient power levels and exposure durations, RF radiation has the ability to heat biological tissue. Thermal effects can include eye damage, sterility, and cognitive impairments.<sup>1</sup>

Even though the FCC recommends that wireless carriers control exposure to harmful RF radiation using safety protocols such as signs, barricades, and training, it has come to our attention that these recommendations have not consistently been implemented to protect workers.

We urge the FCC and the Occupational Safety and Health Administration (OSHA) to work together to enforce exposure limits and ensure wireless carriers are taking the required precautions to protect the safety of all persons who may be exposed to dangerous levels of RF radiation near wireless towers.

To close gaps in their networks and to satisfy the voracious consumer demand for their services, wireless carriers depend on leasing rooftop space and building access from property managers. As a result, cellular antennas are now found atop all kinds of buildings, including apartment buildings, schools, hospitals, places of worship, fire stations, communication towers, and other public and private buildings. Even our nation's cellular towers, which are generally free-standing structures with restricted external access, also pose both RF radiation and climber safety occupational hazards that need to be addressed to protect the workforce.

Rooftop and building mounted antenna sites also endanger not only the wireless industry's trained RF technicians but also roofers, water proofers, electricians, carpenters, building maintenance

<sup>1</sup> <http://www.ambest.com/directories/bestconnect/EmergingRisks.pdf>

personnel, HVAC technicians, painters, firefighters, and other workers who may come in close proximity and be placed at risk of RF injuries.

While wireless carriers take important precautions, such as outfitting their employees with protective equipment, providing RF exposure monitoring units, and even powering down antennas to eliminate the RF radiation hazard, their subcontractors and unaffiliated third-party workers are not regularly afforded these same protections. These subcontractors and third parties often receive no RF safety training and are left on their own to determine the existence, location, and degree of the RF radiation hazards.

Further complicating the situation, RF radiation cannot be felt, and many cellular antennas these days are constructed in a camouflage style and made to look like part of the buildings they are attached to. Known as "stealth antennas," they can be undetectable to the untrained eye. This practice further hinders efforts by even the most earnest workers to properly protect themselves. It is crucial that workers are able to take steps to safeguard themselves from the RF radiation.

A report last October from the *Wall Street Journal* revealed that one in ten antenna sites does not adhere to FCC guidelines for providing the appropriate level of awareness and control to workers who may be exposed to RF radiation above the limits for the general population.<sup>2</sup> In addition, last year, Verizon Wireless and the FCC's Enforcement Bureau entered into a consent decree for Verizon's alleged violations of RF exposure limits at rooftop antenna sites in Hartford, Connecticut and Philadelphia, Pennsylvania. It is unacceptable that RF warning signs have been found missing, mislabeled, unintelligible, or out-of-date, and that strategies to control access (e.g. barricades, locks, and fences) are in disrepair.

In light of these problems, the FCC has a responsibility to ensure the existence of – and compliance with – a comprehensive worker-safety framework.

We are pleased that the FCC's March 27, 2013 *Report and Order* reminds FCC licensees of their obligation to address worker exposure issues, and clarifies that workers subject to the occupational limits must be fully aware of and able to exercise control over their RF exposure. We have also noted that the *Further NPRM* advances new specific requirements for ensuring licensees comply with exposure limits under the different RF exposure categories.

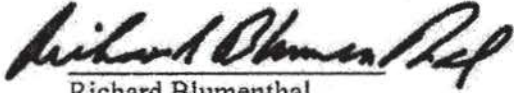
We urge the FCC to move swiftly to finalize the *Further NPRM*, and to consult with OSHA and others to ensure that the final rule is effective. We also expect that in the interim, the FCC, in collaboration with OSHA, will continue to proactively enforce all existing requirements, including tower-climber safety, and hold accountable all licensees that fail to implement the safeguards required to protect workers.

We look forward to hearing what next steps you have planned to make sure that the expansion of our telecommunications infrastructure does not come at the expense of the health and safety of hardworking Americans. Thank you for your attention to this very important occupational health and safety matter.

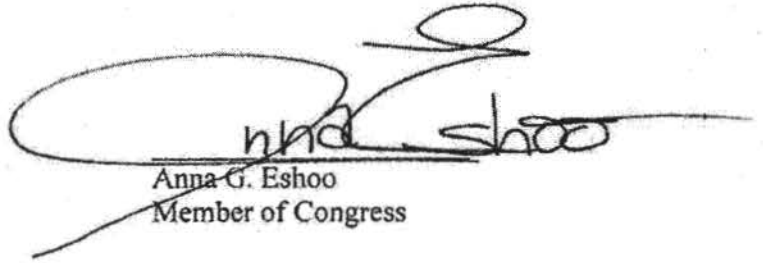
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<sup>2</sup> <http://online.wsj.com/articles/cellphone-boom-spurs-antenna-safety-worries-1412293055>

Sincerely,



Richard Blumenthal  
United States Senate



Anna G. Eshoo  
Member of Congress

Cc: Thomas E. Perez, Secretary of Labor